

The MICROSCOPE mission : test of the equivalence principle in space

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MICROSCOPE is a scientific mission in the fields of fundamental physics proposed by ONERA and the Observatoire de la Côte d'Azur (OCA). It aims at testing the Equivalence Principle between inertial mass and gravitational mass with an accuracy of 10^{-15} i.e., almost three orders of magnitude better than the present on-ground experiments.

The MICROSCOPE space experiment consists in testing very accurately the universality of free-fall of two masses made of different materials, on-board a drag-free satellite in low-earth orbit. The core instrument is based on two ultra-sensitive, tri-axial electrostatic differential accelerometers.

This space experiment will take advantage of the undisturbed environment on board the drag-free satellite, the non-gravitational forces applied on the satellite being compensated by the action of micro-thrusters, and of the lower fluctuations of the gravity gradient. It will need acceleration measurements lower than $10^{-15}g$ and a very precise analysis of the residual orbit perturbations.